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HERMANN EINARSSON and UNNSTEINN STEFÁNSSON:

DRIFT BOTTLE EXPERIMENTS
in the Waters between Iceland, Greenland and Jan Mayen during the years 1947 and 1949

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DRIFT-BOTTLE EXPERIMENTS
in the Waters Between Iceland, Greenland and Jan Mayen during the years 1947 and 1949

by

HERMANN EINARSSON and UNNSTEINN STEFÁNSSON

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I. INTRODUCTION

The results of drift-bottle experiments in the Northern North Atlantic carried out during the years 1891—1939 were discussed by Hermann and Thomsen in 1946 1). As this comprehensive work includes all data available up to that time it will not be necessary to refer to earlier work here. The present report deals with experiments made in the course of hydrographic work in the waters north of Iceland. Our main purpose is to present the data at present available for comparison with earlier and later records as they seem to supplement those of Hermann and Thomsen in a useful way, and amplify their conclusion to a considerable degree. Two questions of considerable significance for future research are also raised.

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1) F. Hermann and H. Thomsen: Drift-bottle Experiments in the Northern North Atlantic. — Medd. Komm. for Danmarks Fiskeri og Havundersögelser. Ser. Hydrogr. Bd. III, Nr. 4, 1946.

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II. PLACES OF LAUNCHING

In order to facilitate comparison with Hermann and Thomsen's data we have divided the oceanic region, where the launchings took place, into similar areas. However, we have no launchings in their areas 'a' and 'e'; we have extended their areas 'b' and 'd' somewhat eastwards and northwards respectively, and our area 'f' is more limited than their corresponding area.

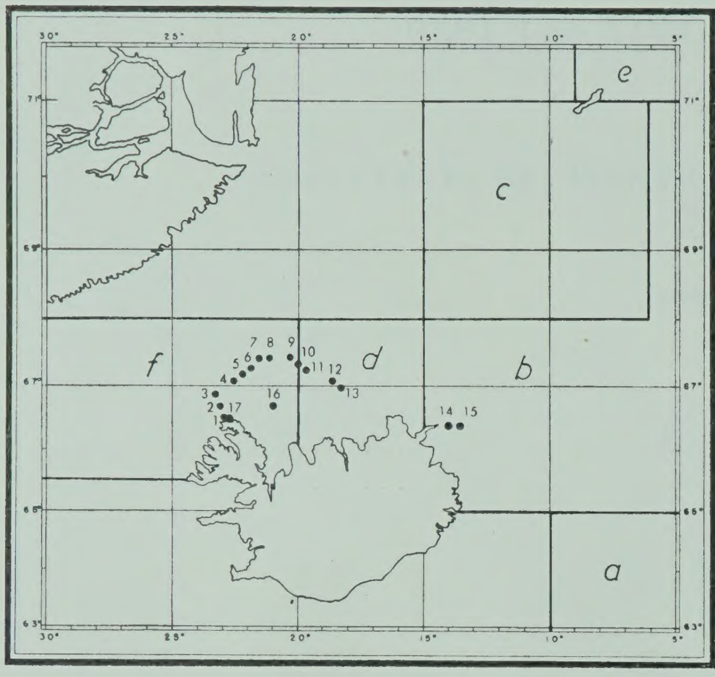

Fig. 1.
Areas (a, b, c, d, e, f,), places of launching and serial numbers of experiments during 1947.

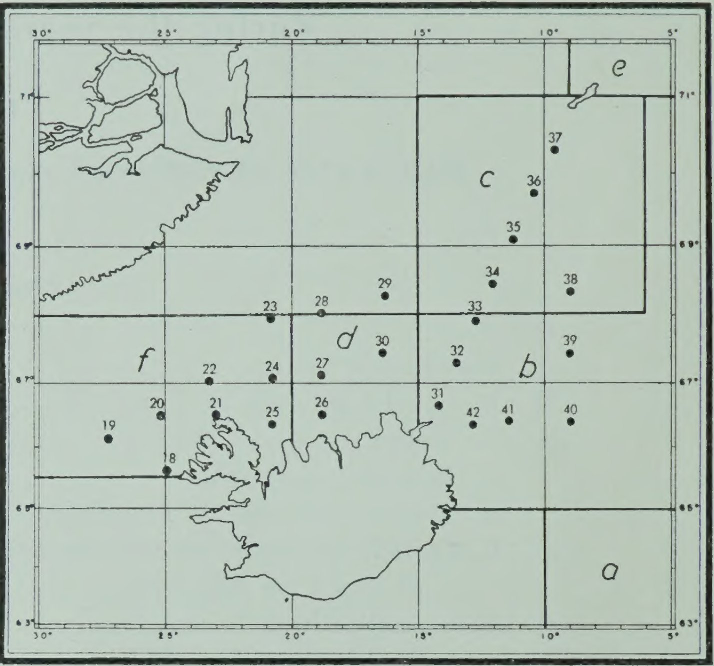

Fig. 2.
Areas, places of launching and serial numbers of experiments during 1949.

The places of launching and the serial numbers of the experiments are shown in fig. 1 for 1947 and fig. 2 for 1949. The limits of the areas are also shown.

III. RECOVERIES

A. *Recovery Percentages*

During 1947 we liberated 380 bottles of which 71, or 19%, were recovered. During 1949, 480 bottles were launched of which 59, or 12%, were recovered. The recovery percentage over both years is 15%.

This percentage is lower than the 22% average recovery recorded by Hermann and Thomsen. Our returns do not, however, seem unduly low when we consider that many of the drift-bottles have probably been crushed by ice or stranded in unpopulated or sparsely populated areas such as the Greenland coasts.

B. *The Material and its Treatment*

The number of drift-bottles recovered, totalling 130, and the places of recovery are shown in the following table:

Iceland	Norway	Faroes	Shetl. and Orkneys	Denmark	Eire	France
72	44	5	3	2	3	1

Of these 4 bottles were found adrift.

In listing the returns we have divided the Icelandic coasts into the areas shown in fig. 3, while the Norwegian coasts is divided according to the practice used by Hermann and Thomsen, i. e.

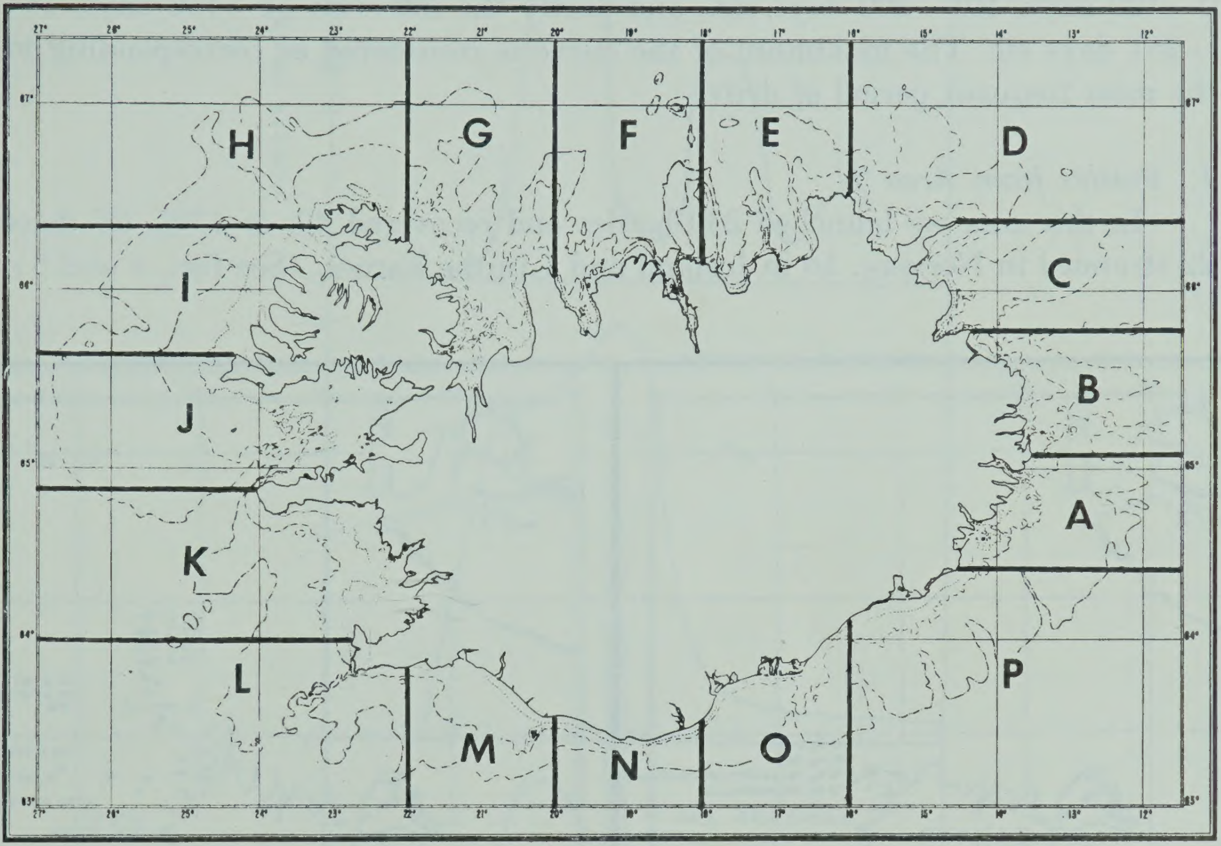

Fig. 3.
Division of the Icelandic coasts into areas (A—P).

N_1: The coast south of 62° N
N_2: — — between 62° N and 65° N
N_3: — — — 65° N and 67° 30′ N, Lofoten not included
N_4: — — — 67° N and 70° N 21° E and Lofoten
N_5: — — east of 21° E

Table 1 gives a survey of the recoveries, arranged in areas both of launching and of recovery; the numbers refer to the drift days of each bottle.

C. *Drift Periods and Places of Stranding*

The data is presented graphically in two ways, i. e.
1) On charts, showing the places of launching and the probable initial drift direction of the bottles, with the number of drift days and the area of stranding.
2) In curves, showing the frequency distribution of the periods of drift, comparison being made with previous data when this is possible. These curves show the period of drift as the abscissae, while the ordinates denote the number of bottles stranded within intervals of 100 days. In order to eliminate accidental variations, overlapping intervals have been used, partly the intervals: 0—100 days, 101—200 days etc., and partly the intervals 51—150 days, 151—251 days etc. The maximum of the curve is considered as corresponding to the most frequent period of drift.

1. Bottles from Area 'b'.

In this area we launched 230 bottles and recovered 39, or 17%. Of these 22 stranded in Norway, 16 in Iceland and 1 in the Faroes. (See figs. 4 and 5).

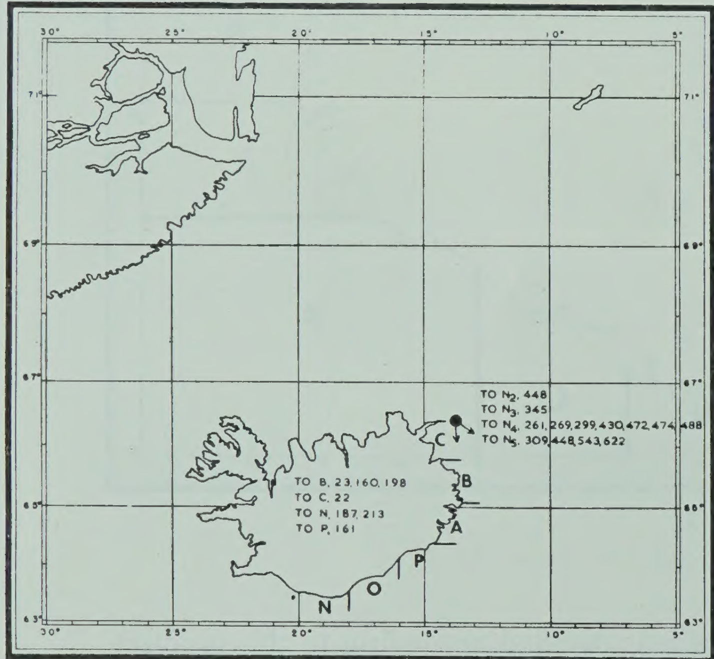

Fig. 4.
Recovered bottles from area "b" (1947 experiments). Number of drift days and country and area of recovery.

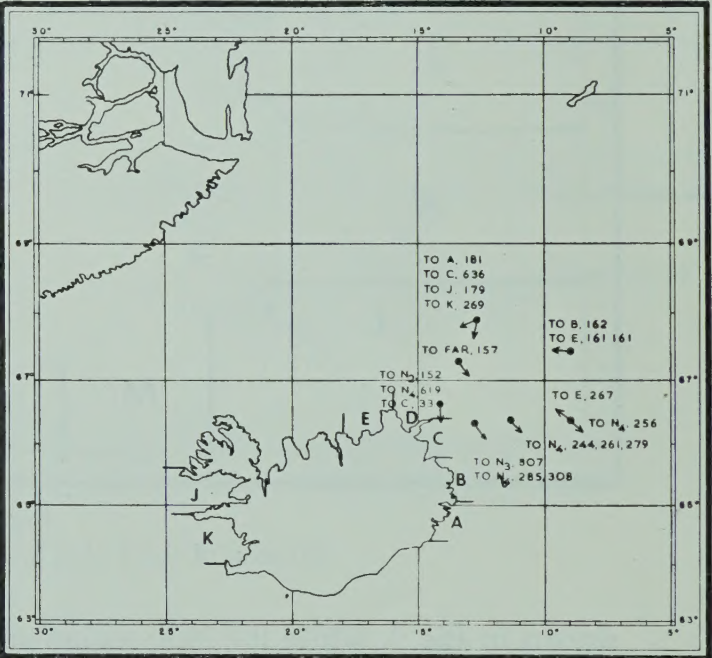

Fig. 5.
Recovered bottles from area "b" (1949 experiments). Number of drift days, country and area of recovery.

Of the 22 Norwegian strandings, 18 were in northern Norway (N_4 and N_5). The frequency distribution of the periods of drift to these areas of stranding is shown as a graph in fig. 6.

Two main periods of drift can be discerned, viz. about 275 days and 475 days. Previous records also show two main maxima, one at 225 days and one at 375 days. Hermann and Thomsen remark that the bottles belonging to the former maximum were launched in the summer of 1919, whereas the bottles forming the latter maximum were launched in other years. Possibly

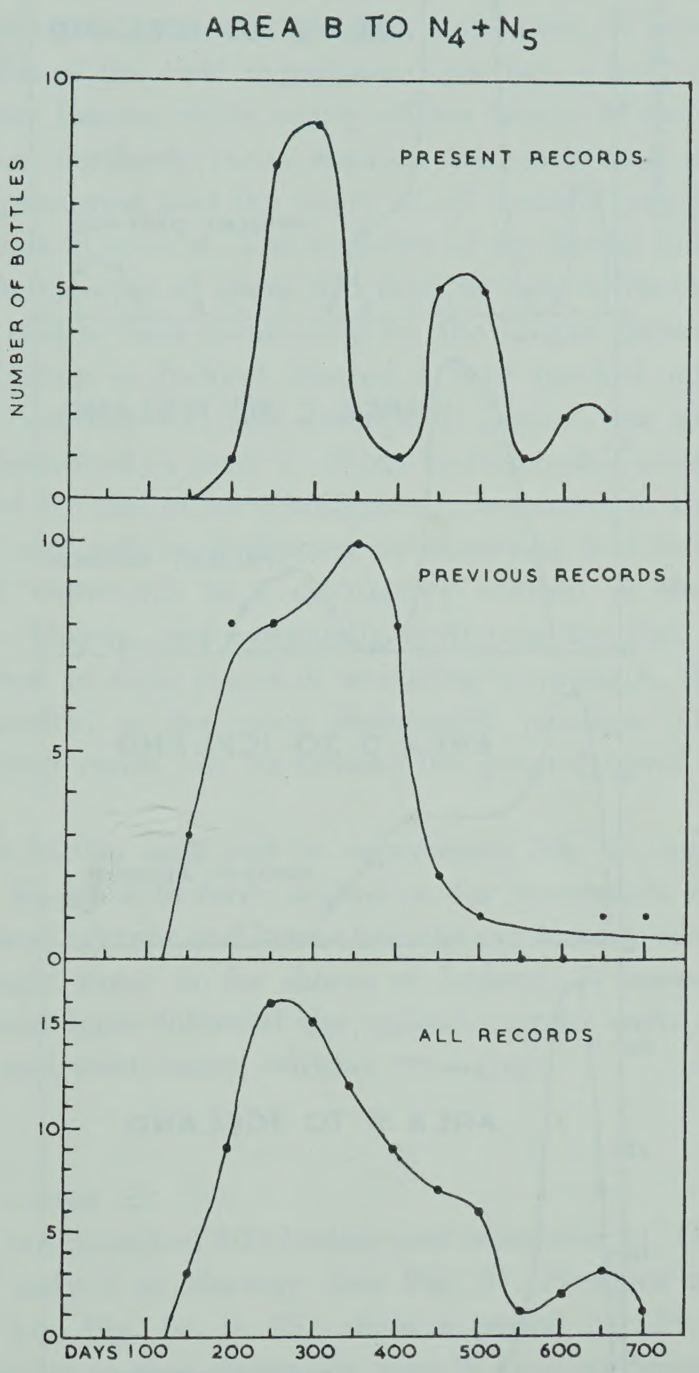

Fig. 6.

Frequency distribution of drift time for bottles launched in area "b" and recovered in areas N_4 and N_5 on the Norwegian coast.

the two maxima are due to annual differences in the rate of the ocean currents, but they might also indicate a more direct northerly route and a longer southerly route. It is interesting to note that nearly all the bottles with long

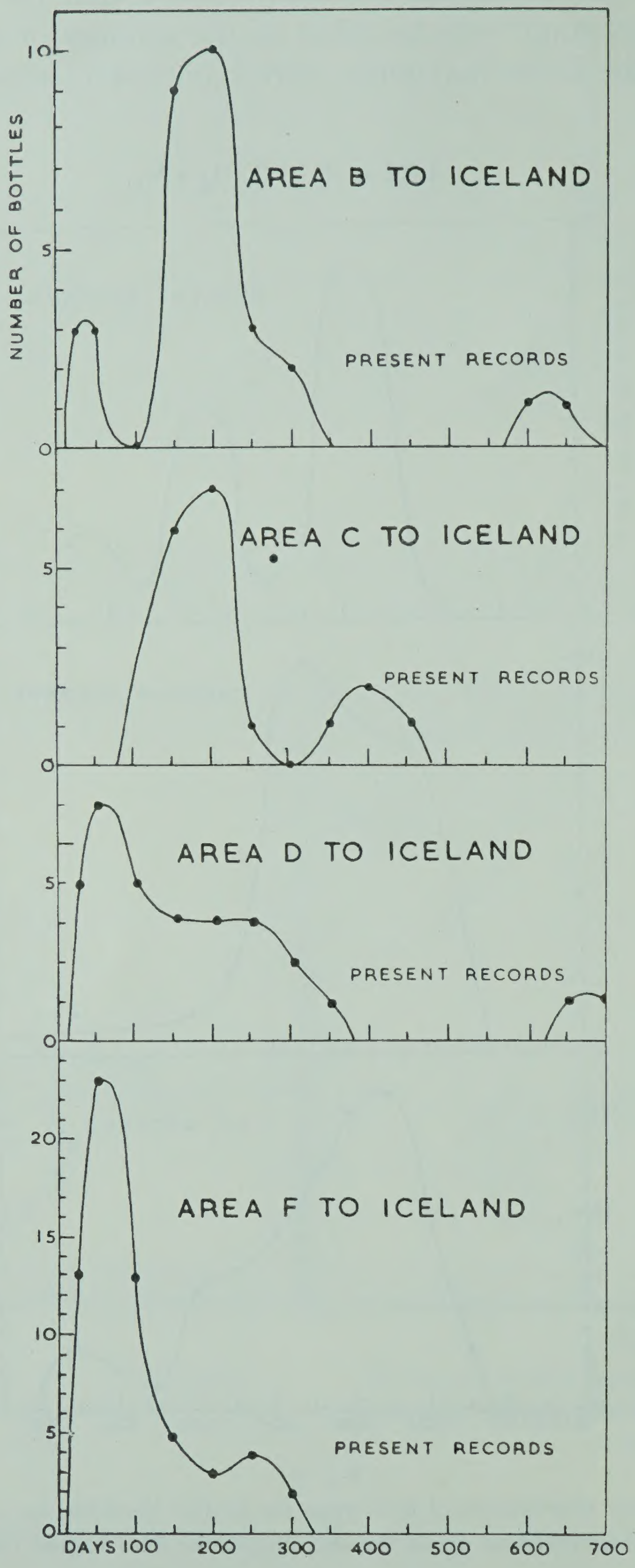

Fig. 7.
Frequency distribution of drift time for bottles launched in areas "b", "c", "d", "f" and recovered on the coasts of Iceland.

drift periods were launched in 1947, while those of short drift period were launched in 1949, when hydrographic evidence indicates that the East Icelandic current was stronger than in 1947. The localities of launching were different in the two years. In 1947 the bottles were launched a short distance east of Langanes, while in 1949 they were launched both close to the shore and in oceanic waters farther to the east and north. It seems probable that most of the bottles of the 1947 experiments got into a current running southwards, towards the Faroes, while nearly all the bottles of the 1949 experiments took a more direct northerly route towards the north coast of Norway.

It may be presumed that the curve of all records (see Fig. 6) shows the general drift trends in area 'b'. The majority of the bottles followed a northerly course, with a drift period of about 275 days or less, while the others followed more southerly routes, thus accounting for the longer periods of drift.

Bottles stranding in Iceland showed a very marked maximum of about 175 drift days (see Fig. 7). The same drift period was also found for the Iceland bottles launched in area 'c'. From hydrographic evidence, which later will be presented by one of us (Stefánsson), we come to the conclusion that this drift period can only be explained by assuming that the bottles first drift northwards and westwards in a circulatory current in the waters between Iceland and Jan Mayen, and eventually drift into the East Icelandic current which brings them to their places of stranding in areas A, B, C, E, N, and P. The bottles launched at the more shorewards positions may perhaps have taken a more direct route, but we believe the general trend to be as described above.

Two of the bottles launched in experiment No. 33, and which stranded in areas J and K, seem to have drifted so far westwards that they got into the East Greenland current and hence into the circulatory eddy of the Irminger Sea which brought them to the shores of Iceland. It seems improbable that these bottles could have followed the coastal current such a long way along the east, south and west coasts, without stranding.

2. *Bottles from Area 'c'.*

In area 'c' we launched 100 bottles and recovered 11. Of these 9 stranded in Iceland and only 2 in Norway (see Fig. 8). Previous records (Hermann and Thomsen, l.c., Fig. 5c, p. 25) show a period of 225 days to northern Norway, i.e. similar to that shown for area 'b', but our material adds nothing to our knowledge of this drift route. The drift periods recorded for our two bottles were 340 and 584 days respectively.

One of the most interesting facts emerging from our records is that 9 out of 11 recovered bottles from area 'c' drifted to Iceland. As stated above we believe this to be an indication of a circulatory movement in the oceanic waters between Iceland and Jan Mayen, the initial drift direction from area 'c' being westwards. The drift period is similar to that for area 'b' to Iceland, viz. about 175 days (see Fig. 7).

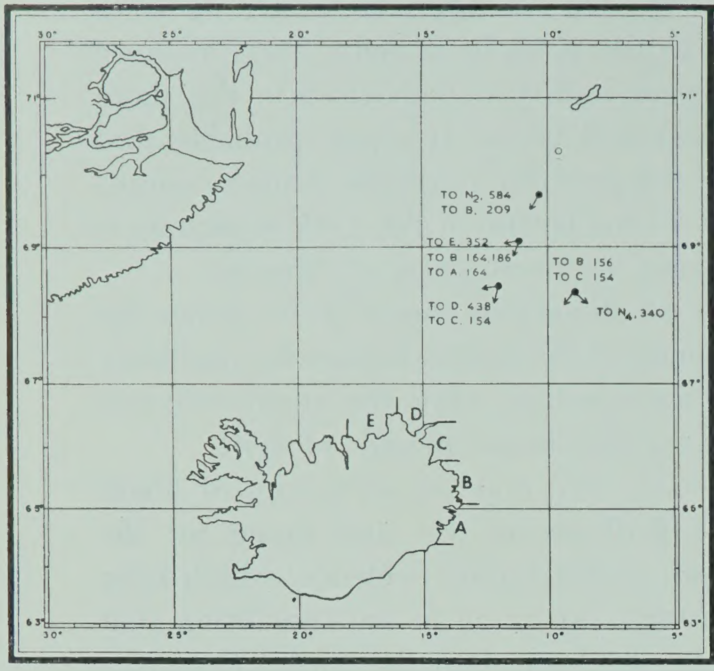

Fig. 8.
Recovered bottles from area "c". Number of drift days, country and area of recovery.

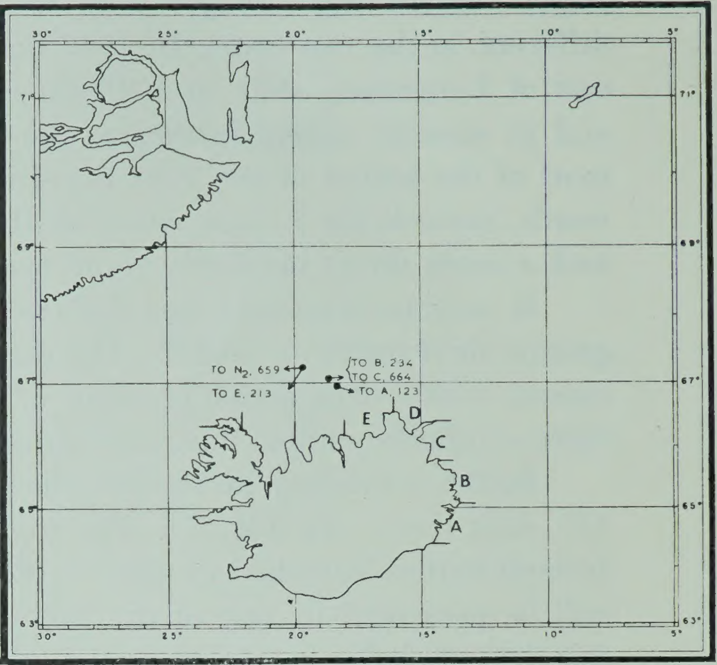

Fig. 9.
Recovered bottles from area "d" (1947 experiments). Number of drift days, country and area of recovery.

3. *Bottles from Area 'd'.*

In this area we launched 122 bottles and recovered 16, or 13%. Of these 13 stranded in Iceland, 1 in Norway, 1 on the Orkneys and 1 on the coast of France (see Figs. 9 and 10).

The Icelandic strandings can be divided into two groups, with a short or a long period of drift (see Fig. 7). The former includes those bottles stranding in areas, E, G and H with 17, 18, 46, 51 and 70 drift days, and the latter includes those bottles with somewhat varying drift periods.

A clear indication of the westward drift is given by the two bottles which stranded in Orkney and France (see Fig. 10), after drift periods of 693 and 645 days respectively. These bottles must certainly have drifted southwards with the East Greenland current and from it to the Gulf Stream area of the Irminger Sea and eastwards to their places of stranding. The bottle stranding in area O on Iceland, after a drift period of 314 days, most probably began by following a similar course.

The results obtained from area 'd' indicate very strongly that within the North-Icelandic coastal area the current system is more complex than has hitherto been shown on the current charts. This will also be supported by the hydrographical material of recent years.

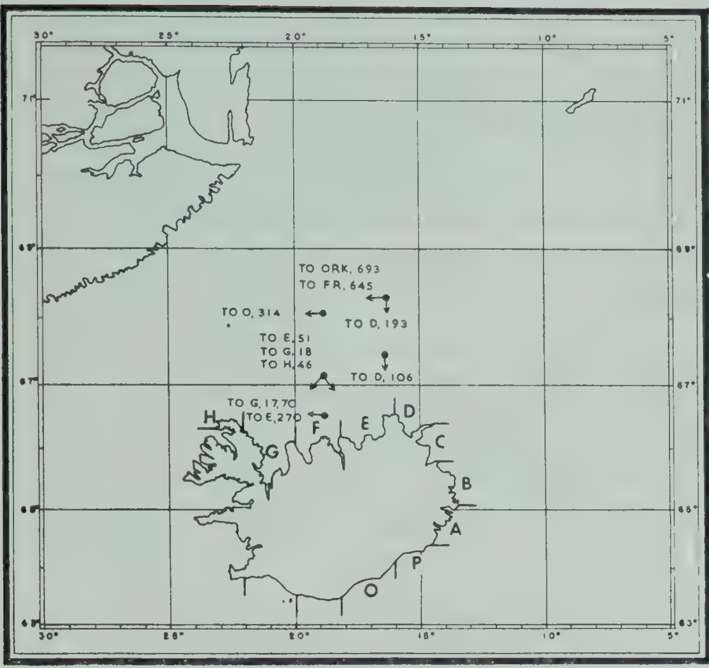

Fig. 10.
Recovered bottles from area "d" (1949 experiments). Number of drift days, country and area of recovery.

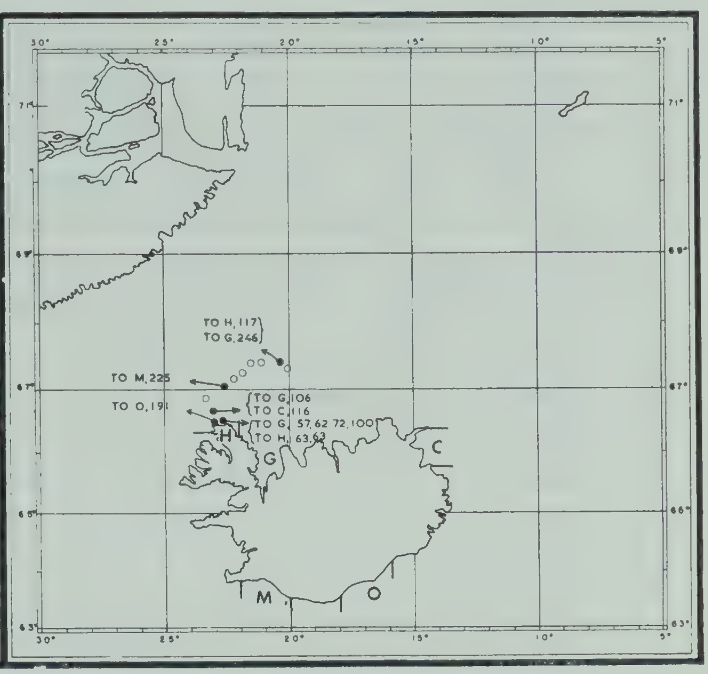

Fig. 11.
Bottles recovered in Iceland from area "f" (1947 experiments). Number of drift days and area of recovery.

4. *Bottles from Area 'f'.*

In area 'f' we launched 308 bottles and recovered 63, or 20%. These bottles stranded in various places, viz. 33 in Iceland, 19 in Norway, 4 on the Faroes, 3 in Eire, 2 on the Hebrides and 2 in Denmark (see Figs. 11—13).

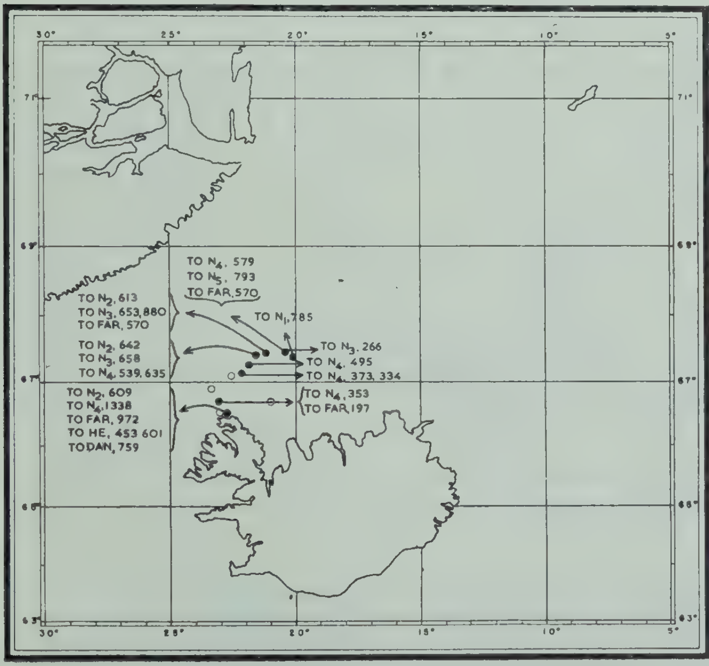

Fig. 12.
Long drifting bottles from area "f" (1947 experiments). Number of drift days, country and area of recovery.

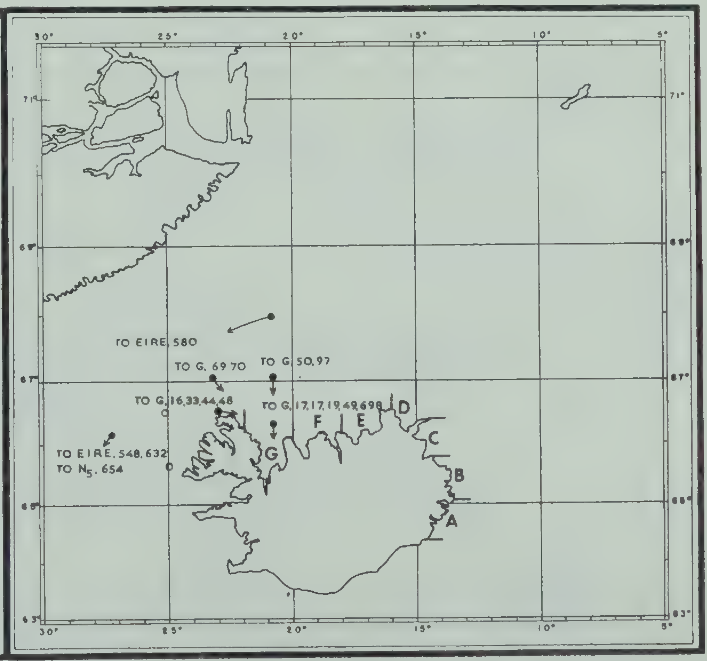

Fig. 13.
Recovered bottles from area "f" (1949 experiments). Number of drift days, country and area of recovery.

This great scattering of the drift bottles becomes conceivable when we consider that within this area we encounter very complicated hydrographic conditions and two main currents that flow in opposing directions.

The bottles stranding in Iceland were all launched in the eastern part of this area. Most of these bottles have a very short period of drift as shown in the graph in Fig. 7. They were mainly recovered in area G, south or south-east of the place of launching, especially those launched in 1949. During this year some bottles were launched in Húnaflói, east of Horn, and they have accordingly the shortest drift period (about 20 days). The bottles stranded in Iceland from launchings in 1947, were also mostly recovered in area G, although 1 bottle was recovered in area C on the north-east coast. The bottles recovered in areas M and O, after drift periods of 225 and 191 days respectively, have undoubtedly been brought into an eddy whereby they were carried to the south-west and into the Irminger Sea.

When we turn our attention to the bottles stranded in Norway we can discern two main maxima, one of about 350 days and one of about 650 days, as shown in the graph in Fig. 14. We interpret these maxima in accordance with our previous reasoning. The maximum at about 350 days is then explained by bottles which drifted in the East Icelandic current along the shorter route through area 'b' (c.f. above). On the other hand the maximum at about 650 days is explained by bottles which first drifted westwards into the East Greenland current, and from this current then drifted eastwards towards the shores of Europe. More bottles seemed to follow the longer drift

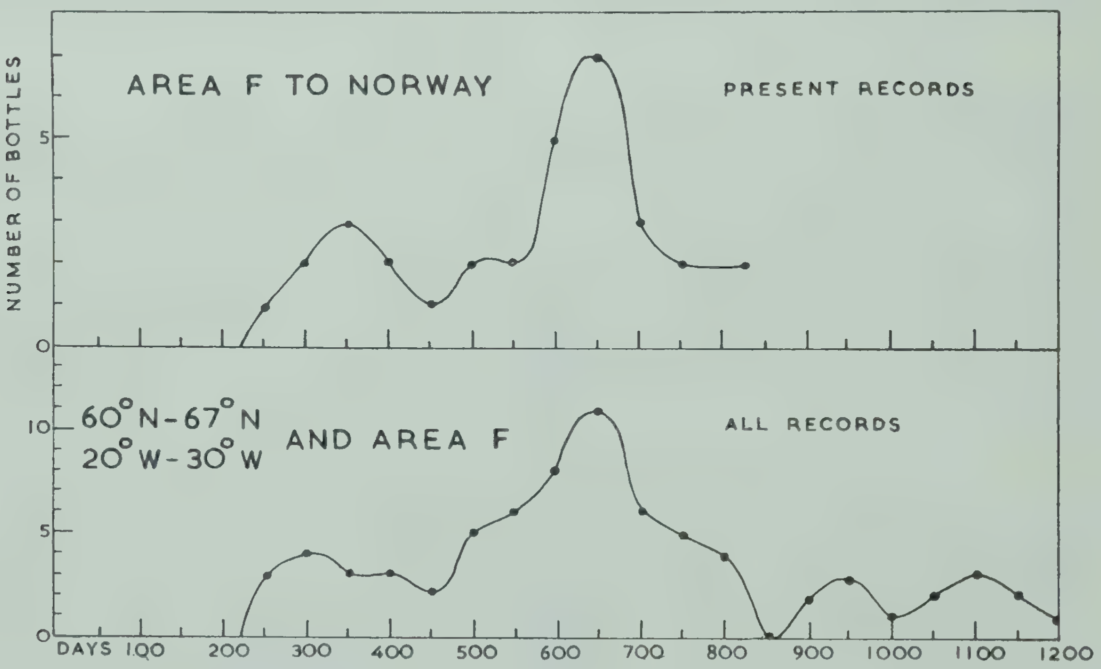

Fig. 14.
Frequency distribution of drift time for bottles launched in area "f" and area 60°—67° N and 20°—30° W, and recovered on the coasts of Norway.

route than would be expected, but the interpretation gets support from two sources. Firstly, we consider it most probable that our own bottles from area 'f', which stranded on the Faroes, Hebrides, in Eire, Denmark, and France, followed a similar route for a considerable part of their drift. Secondly, previous launching of drift-bottles in the area 60° N — 67° N and 20° W — 30° W show a maximum at about 600 days (Hermann and Thomsen, l.c., Fig. 19, p. 53). This is also reflected in the graph in Fig. 14, which shows all records of drift periods from that area and from our area 'f'.

It will be noted that all the bottles but one, launched in 1947 just north of 67° N, stranded in Norway after relatively short periods of drift, whereas the bottles launched in this locality in 1949 were recovered in Iceland in area G. Moreover, one bottle launched in 1947 at a short distance from Kögur was recovered on the Faroes and another in Norway, after 197 and 353 drift days respectively, whereas the bottles launched in this area in 1949 were recovered in Iceland. There is thus a definite indication that the current flowing eastwards along the north coast of Iceland was much stronger in 1947 than in 1949, which is in agreement with the hydrographic records showing that in July 1949 there was an eddy motion in this area.

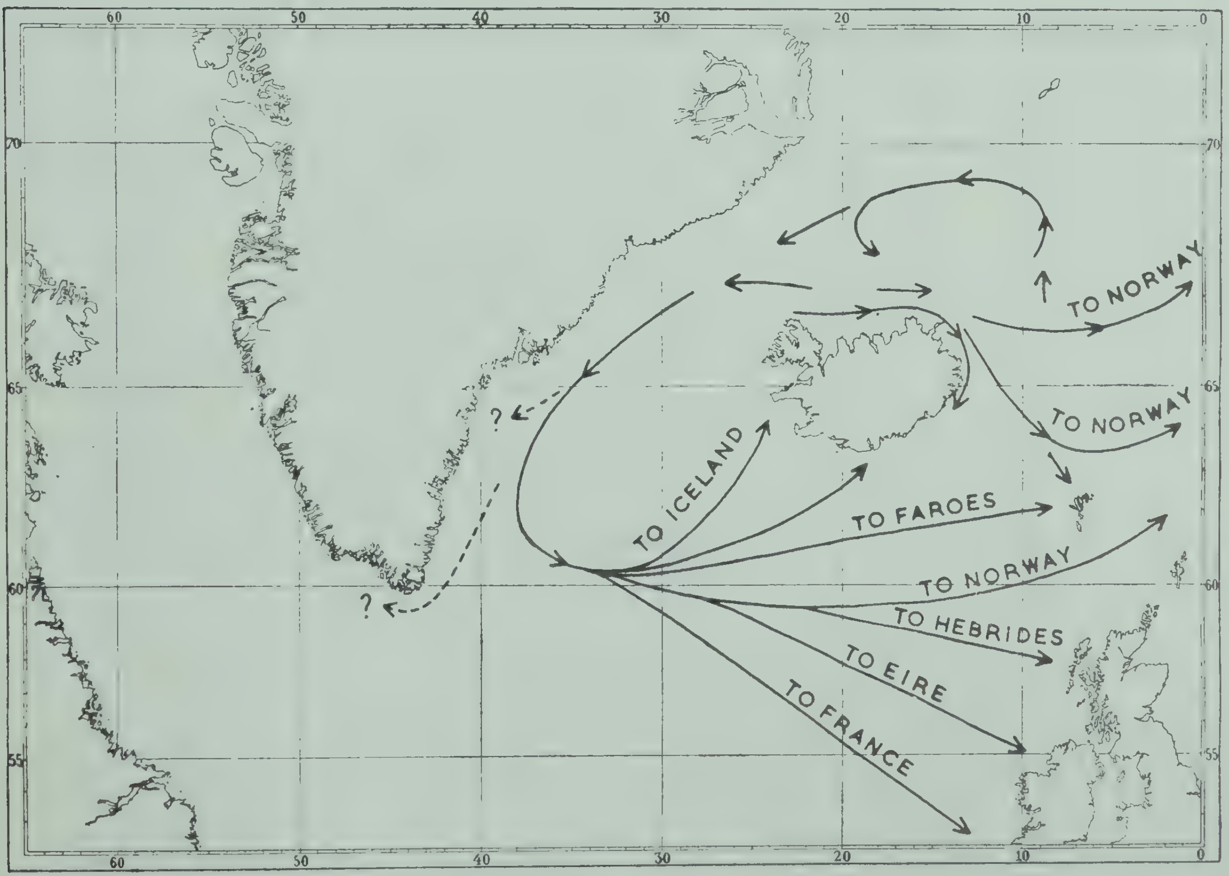

Fig. 15.
A schematical picture of the probable drift from northern and eastern Icelandic offshore waters.

IV. CONCLUSIONS

Our results seem to lend support to the following conclusions:

1. From area 'b' there seem to be two drift routes to Norway, a shorter and a longer one, indicated by drift periods of 275 and 475 days respectively.

2. There seems to be a circulatory movement in the waters south of Jan Mayen, bringing drift bottles westwards from areas 'b' and 'c' along a northerly route and then southwards into the East Greenland current or eastwards into the East Icelandic current.

3. From area 'f' many drift bottles go southwards and cross the northern Atlantic, ultimately stranding in France or Eire, on the Hebrides or Shetlands, on the Faroes or in Norway or Denmark.

The probable drift routes are shown schematically in Fig. 15.

ACKNOWLEDGEMENT

The authors want to tender their thanks to Dr. James H. Fraser, Aberdeen, for amending the English text.

TABLE I

NUMBER OF DRIFT DAYS ARRANGED ACCORDING TO AREAS OF LAUNCHING AND AREAS OF RECOVERY.
BOTTLES FOUND ADRIFT ARE GIVEN IN ITALICS.

Exp. No.	*No.*	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*I*	*J*	*K*	*L*	*M*	*N*	*O*	*P*	N_1	N_2	N_3	N_4	N_5	*Far.*	*Ork.*	*He.*	*Eire*	*Dan.*	*Fr.*
Area b.																												
14	50														213		161		448	345	488	488						
																					269	622						
																					430	543						
																					474							
																					261							
15	50		160	22											187						299	309						
			198																		472							
			23																									
31	20			*33*															152		619							
32	20																						157					
33	20	181		636							179	269																
39	20		162			161																						
						161																						
40	20					267															256							
41	20																				244							
																					261							
																					279							
42	10																			307	285							
																					308							
Area c.																												
34	20			154	438																							
35	20	164	164			352																						
			186																									
36	20		209																584									
37	20*																											
38	20		156	154																	340							

*) No recoveries.

TABLE I (CONTINUED)

Exp. No.	*No.*	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*I*	*J*	*K*	*L*	*M*	*N*	*O*	*P*	N_1	N_2	N_3	N_4	N_5	*Far.*	*Ork.*	*He.*	*Eire*	*Dan.*	*Fr.*
Area d.																												
11	10					213													659									
12	10		234	664																								
13	12	123																										
26	10					270		17 70																				
27	20					51	*1*	18	46																			
28	20															314												
29	20				193																			693				645
30	20				106																							
Area f.																												
1	10															191												
2	10			116				106													353		197					
3	10*																											
4	10*																											
5	10													225							373 334							
6	10																				495							
7	20																		642	658	539 635							
8	20																		613	653 880			574					
9	20		246						117											266	579 668	793	570				663	
10	10																	785										
16	56							22 299																				

*) No recoveries.

TABLE I (*CONTINUED*)

Exp. No.	No.	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*I*	*J*	*K*	*L*	*M*	*N*	*O*	*P*	N_1	N_2	N_3	N_4	N_5	*Far.*	*Ork.*	*He.*	*Eire*	*Dan.*	*Fr.*
Area f. (*Continued*)																												
16								18																				
								18																				
								11																				
								18																				
								299																				
17	62	129						57	63										609		1338		972		453		759	
								62	63																601			
								100																				
								72																				
18	20*																											
19	20																					654				548		
																										632		
20	20*																											
21	20							33																				
								48																				
								16																				
								44																				
22	20							69																				
								70																				
23	20																									580		
24	20							97																				
								50																				
25	20							49																				
								19																				
								17																				
								17																				
								698																				

*) No recoveries.

APPENDIX

A List of Experiments and Recovered Driftbottles

No.	*Locality*	*Country*	*Date*	*No. days*
	Experiment No 1. Number of bottles: 10.			
	Liberation: Pos.: 66° 30′ N — 23° 00′ W. 21/7 1947. 0.25 a.m.			
185	Kvískerjafjara.	IO	28. 1 – 48	191
	Experiment No 2. Number of bottles: 10.			
	Liberation: Pos.: 66° 41′ N — 23° 09′ W. 21/7 1947. 2.08 a.m.			
173	Breineset, Dvergberg herred.	N_4	8. 7. – 48	353
189	Lambanes, Langanes.	IC	14. 11 – 47	116
395	Ingólfsfjörður, Strandasýsla.	IG	14. 11 – 47	106
196	Thorshavn.	Far	3. 1 – 48	197
	Experiment No 3. Number of bottles: 10.			
	Liberation: Pos.: 66° 53′ N — 23° 19′ W. 21/7 1947. 3.45 a.m.			
	No recoveries.			
	Experiment No 4. Number of bottles: 10.			
	Liberation: Pos.: 67° 04′ N — 22° 36′ W. 21/7 1947. 6.20 a.m.			
	No recoveries.			
	Experiment No 5. Number of bottles: 10.			
	Liberation: Pos.: 67° 09′ N — 22° 16′ W. 21/7 1947. 8.00 a.m.			
211	Baugstaðafjara S. of Knarrarós Lighthouse.	IM	2. 3 – 48	225
225	Svinöy pr. Vagehavn, Nordlandsfylke.	N_4	28. 7 – 48	373
239	Nordfuglö, Tromsfylke.	N_4	20. 6 – 48	334
	Experiment No 6. Number of bottles: 10.			
	Liberation: Pos.: 67° 15′ N — 21° 56′ W. 21/7 1947. 9.50 a.m.			
188	Biksvær ved Bodö.	N_4	27. 11 – 48	495
	Experiment No 7. Number of bottles: 20.			
	Liberation: Pos.: 67° 26′ N — 21° 34′ W. 21/7 1947. 11.00 a.m.			
243	Storhallaren, Sör Fröya.	N_2	23. 4 – 49	642
251	Röst, Lofoten.	N_4	11. 1 – 49	539
245	Oddöy, Steneset, Helgeland.	N_3	9. 5 – 49	658
261	Veseröy ved Bodö.	N_4	16. 4 – 49	635
	Experiment No 8. Number of bottles: 20.			
	Liberation: Pos.: 67° 26′ N — 21° 15′ W. 21/7 1947. 12.15 a.m.			
2	Kavik, Toft pr. Brönnoysund.	N_3	18. 12 – 49	880
320	Fitjana, Vestmanna.	Far	14. 2 – 49	574
10	Næröyherred, Namdalen.	N_3	4. 5 – 49	653
9	Halten.	N_2	26. 3 – 49	613
	Experiment No 9. Number of bottles: 20.			
	Liberation: Pos.: 67° 26′ N — 20° 24′ W. 21/7 1947. 15.30 a.m.			
228	Revsneshamn, ved Hammerfest.	N_5	22. 9 – 49	793
246	Alsöy, Stamsund.	N_4	20. 2 – 49	579
242	Vestmanhavn.	Far	11. 2 – 49	570
11	Slettestrand, pr. Fjerriilslev, Thisted-Amt.	Dan	15. 6 – 49	663

No.	*Locality*	*Country*	*Date*	*No. days*
41	Héraðssandur, 2 km norðan við Selfljótsós.	IB	23. 3 – 48	246
37	Reykjarfjörður, Grunnavíkurhr., N-Ísafjarðars.	IH	15. 11 – 47	117
43	Röst, Lofoten.	N_4	19. 5 – 49	668
12	Vandve, Helgeland.	N_3	12. 4 – 48	266

Experiment No 10. Number of bottles: 10.

Liberation: Pos.: 67° 20′ N — 20° 02′ W. 21/7 1947. 16.50 a.m.

20	N. Eigeröy, Egersund.	N_1	14. 9 – 49	785

Experiment No 11. Number of bottles: 10.

Liberation: Pos.: 67° 15′ N — 19° 41′ W. 21/7 1947. 17.45 a.m.

34	Varnes, pr. Stavoy.	N_2	11. 5 – 49	659
31	Sandsreki við Skjálfanda.	IE	20. 2 – 48	213

Experiment No 12. Number of bottles: 10.

Liberation: Pos.: 67° 05′ N — 18° 39′ W. 21/7 1947. 19.10 a.m.

56	Langanes.	IC	16. 5 – 49	664
50	Héraðssandur.	IB	12. 3 – 48	234

Experiment No 13. Number of bottles: 12.

Liberation: Pos.: 66° 59′ N — 18° 20′ W. 21/7 1947. 20.10 a.m.

48	Breiðdalsvík, S.-Múlas.	IA	22. 11 – 47	123

Experiment No 14. Number of bottles: 50.

Liberation: Pos.: 66° 22′ N — 14° 01′ W. 26/8 1947. 14.20 a.m.

306	Grunnfornes i Senja, Tromsfylke.	N_4	27. 12 – 48	488
313	Skreifjord i Söröysund, V. Finmark.	N_5	17. 11 – 48	448
299	Kjölnes, Öst-Finmark.	N_5	10. 5 – 49	622
301	Masvær i Helgöy, Tromsfylke.	N_5	20. 2 – 49	543
297	Sandnes i Flakstad.	N_4	22. 5 — 48	269
302	Grímsstaðatjörn í Meðallandi.	IN	26. 3 – 48	213
290	Torgvær, Torghatten, Helgeland.	N_3	7. 8 — 48	345
292	Gaukværöy, Vesteralen.	N_4	31. 10 – 48	430
282	Torrholmen, Smöla.	N_2	17. 11 – 48	448
271	16 naut. m. SW of Tromsö.	N_4	13. 12 – 48	474
279	Grötavær.	N_4	14. 5 – 48	261
278	Fjarðarfjara, Papós.	IP	4. 2 – 48	161

Experiment No 15. Number of bottles: 50.

Liberation: Pos.: 66° 22′ N — 13° 35′ W. 26/8 1947. 15.20 a.m.

484	Korsnes, Laksefjordbotn.	N_5	30. 6 – 48	309
475	68° 56′ N. Lat, 4° 10′ E. Long.	N_4	21. 6 – 48	299
491	Alviðruhamravík.	IN	29. 2 – 48	187
488	Skeggjastaðir, Langanes.	IC	17. 9 – 47	22
477	Mjóifjörður, S.-M.	IB	3. 2 – 48	160
456	Héraðssandur.	IB	12. 3 – 48	198
462	Norðfjarðarhorn.	IB	18. 9 – 47	23
466	Ersfj. i Senja Berg herred, Tromsfylke.	N_4	10. 12 – 48	472

Experiment No 16. Number of bottles: 56.

Liberation: Pos.: 66° 24′2 N — 21° 00′ W. 3/9 1947. 22.15 a.m.

109	Drangavík, Strandasýsla.	IG	25. 9 – 47	22

No.	*Locality*	*Country*	*Date*	*No. days*
113	Drangavík, Strandasýsla.	IG	29. 6 – 48	299
121	Drangavík, Strandasýsla.	IG	21. 9 – 47	18
74	Drangavík, Strandasýsla.	IG	21. 9 – 47	18
123	Drangavík, Strandasýsla.	IG	14. 9 – 47	11
126	Drangavík, Strandasýsla.	IG	21. 9 – 47	18
149	Drangavík, Strandasýsla.	IG	29. 6 – 48	299

Experiment No 17. Number of bottles: 62.

Liberation: Pos.: 66° 30'3 N — 22° 58' W. 4/9 1947. 5.00 a.m.

89	Reykjafjörður, Grunnavíkurhr., N.-Ísafjarðars.	IH	6. 11 – 47	63
500	Kjósarnes, Reykjarfjörður, Strandasýsla.	IG	31. 10 – 47	57
368	Broddadalsá, Fellshr., Strandasýsla.	IG	5. 11 – 47	62
365	Rödhus, pr. Pandrup, Hjörring Amt.	Dan	3. 10 – 49	759
360	Reykjafjörður, Grunnavíkurhr., N.-Ísafjarðars.	IH	6. 11 – 47	63
387	Claddad Illaray, Outer Hebrides.	He	30. 12 – 48	453
85	Nord-Dyröy i Fröja.	N_2	5. 5 – 49	609
87	Lonkan, Vesterålen.	N_4	21. 5 – 50	1338
94	Bitrufjörður.	IG	13. 12 – 47	100
92	Vestmanhavn.	Far	4. 5 – 49	972
97	Barra, Outer Hebrides.	He	27. 4 – 49	601
335	Vaðlavík.	IA	11. 1 – 48	129
391	Ófeigsfjörður, Strandasýsla.	IG	15. 11 – 47	72

Experiment No 18. Number of bottles: 20.

Liberation: Pos.: 65° 36' N — 24° 59' 5" W. 12/7 1949.
No recoveries.

Experiment No 19. Number of bottles: 20.

Liberation: Pos.: 66° 07' N — 27° 16' W. 13/7 1949.

526	Rosleigh Island.	Eire	12. 1 – 51	548
527	Ballyferriter, Dingle, Co. Kerry.	Eire	6. 4 – 51	632
537	Lillejavfjordnes, Tarnet, Öst-Finmark.	N_5	28. 4 – 51	654

Experiment No 20. Number of bottles: 20.

Liberation: Pos.: 66° 30' N — 25° 10' W. 13/7 1949.
No recoveries.

Experiment No 21. Number of bottles: 20.

Liberation: Pos.: 66° 29' 5" N — 23° 01' W. 14/7 1949.

561	Mýrar, Hrútafjörður.	IG	17. 8 – 49	33
564	Finnbogastaðir, Trékyllisvík, Árneshr., Strandas.	IG	1. 9 – 49	48
568	Drangar, Árneshr., Strandas.	IG	30. 7 – 49	16
575	Djúpavík, Reykjarfj., Strandas.	IG	28. 8 – 49	44

Experiment No 22. Number of bottles: 20.

Liberation: Pos.: 67° 01' N — 23° 20' W. 15/7 1949.

592	66° 40' N, 20° 55' W.	IG	23. 9 – 49	69
597	Finnbogastaðir, Trékyllisvík, Árneshr., Strandas.	IG	24. 9 – 49	70

Experiment No 23. Number of bottles: 20.

Liberation: Pos.: 67° 57' N — 20° 46' W. 15/7 1949.

603	Ballyferriter, Dingle, Co. Kerry.	Eire	15.—28. 2 – 51	580

No.	*Locality*	*Country*	*Date*	*No. days*
	Experiment No 24. Number of bottles: 20.			
	Liberation: Pos.: 67° 03′ N — 20° 46′ W. 16/7 1949.			
628	Stóra-Fjarðarh., Kollafj., Strandas.	IG	22. 10 – 49	97
641	Skriðnesenni, Strandas.	IG	5. 9 – 49	50
	Experiment No 25. Number of bottles: 20.			
	Liberation: Pos.: 66° 21′ N — 20° 46′ W. 16/7 1949.			
656	Kollafj., Strandas.	IG	4. 9 – 49	49
657	Fúlavík, Kollafj., Strandas.	IG	5. 8 – 49	19
659	Reykjaneshyrna á Ströndum.	IG	3. 8 – 49	17
660	Dyrhólmar, Broddanes, Strandas.	IG	3. 8 – 49	17
670	Sandoddi, Ingólfsfj.	IG	15. 6 – 51	698
	Experiment No 26. Number of bottles: 10.			
	Liberation: Pos.: 66° 25′ N — 18° 49′ W. 18/7 1949.			
680	Sigurðarstaðareki, Melrakkaslétta.	IE	15. 4 – 50	270
691	Birgisvík, Reykjarfj., Strandas.	IG	5. 8 – 49	17
692	Hafnarhólmur, Steingrímsfj.	IG	27. 9 – 49	70
	Experiment No 27. Number of bottles: 20.			
	Liberation: Pos.: 67° 07′ N — 18° 50′ W. 19/7 1949.			
682	Svalbarði, Vatnsnes, V.-Húnavatnss.	IG	7. 8 – 49	18
690	67° 06′ N Lat., 18° 37′ W Long.	IF	20.7 – 49	1
711	Sílalækur, Skjálfandaflói.	IE	9. 9 – 49	51
719	Furufjörður, Grunnavíkurhr., N.-Ísafjarðars.	IH	4. 9 – 49	46
	Experiment No 28. Number of bottles: 20.			
	Liberation: Pos.: 68° 02′ N — 18° 50′ W. 19/7 1949.			
727	V. Breiðamerkurós.	IO	30. 5 – 50	314
	Experiment No 29. Number of bottles: 20.			
	Liberation: Pos.: 68° 17′ N — 16° 18′ W. 19/7 1949.			
742	Heiðarhöfn, Langanes.	ID	29. 1 – 50	193
746	Latan Point, Roskiesholm, Orkneys.	Ork	13. 6 – 51	693
757	Le Port Blanc, Cotes du N. France.	Fr	26. 4 – 51	645
	Experiment No 30. Number of bottles: 20.			
	Liberation: Pos.: 67° 27′ N — 16° 30′ W. 20/7 1949.			
761	Lambanes, Langanes.	ID	4. 11 – 49	106
	Experiment No 31. Number of bottles: 20.			
	Liberation: Pos.: 66° 44′ N — 14° 09′ W. 23/7 1949.			
782	Nordmela, Vesteralen.	N_4	4. 6 – 51	619
785	2 naut. m. S of Skálar.	IC	26. 8 – 49	33
786	Strömmen i Sundelaget.	N_2	18. 12 – 49	152
	Experiment No 32. Number of bottles: 20.			
	Liberation: Pos.: 67° 18′ N — 13° 23′ W. 29/7 1949.			
	Vestmannasund.	Far	3. 1 – 50	157
	Experiment No 33. Number of bottles: 20.			
	Liberation: Pos.: 67° 55′ N — 12° 40′ W. 30/7 1949.			
822	Vöðlasandur, Vaðlavík, Helgust.hr.	IA	28. 1 – 50	181

No.	*Locality*	*Country*	*Date*	*No. days*
827	Skóganes, S.-Miklaholtshr.	IK	11. 5 – 50	269
835	Siglunes á Barðaströnd, Barðastr.hr.	IJ	26. 1 – 50	179
840	Hafralónsós, Þistilfj.	ID	11. 6 – 51	636

Experiment No 34. Number of bottles: 20.

Liberation: Pos.: 68° 31′ N — 12° 00′ W. 30/7 1949.

849	Sandvík, Bakkafj.	IC	1. 1 – 50	154
852	Lambanes, Langanes.	ID	12. 10 – 50	438

Experiment No 35. Number of bottles: 20.

Liberation: Pos.: 69° 06′ N — 11° 15′ W. 30/7 1949.

870	Dvergasteinn, Seyðisfjörður.	IB	11. 1 – 50	164
874	Sigurðarstaðir, Melrakkaslétta.	IE	18. 7 – 50	352
877	Þakeyri, Hamarsfjörður.	IA	11. 1 – 50	164
880	Breiðuvík, Borgarfirði eystra.	IB	1. 2 – 50	186

Experiment No 36. Number of bottles: 20.

Liberation: Pos.: 69° 43′ N — 10° 25′ W. 31/7 1949.

887	Breiðuvík, Borgarfirði eystra.	IB	25. 2 – 50	209
893	Nordvest av Rundöy.	N_2	13. 5 – 50	584

Experiment No 37. Number of bottles: 20.

Liberation: Pos.: 70° 22′ N — 9° 39′ W. 31/7 1949.

No recoveries.

Experiment No 38. Number of bottles: 20.

Liberation: Pos.: 68° 22′ N — 9° 00′ W. 2/8 1949.

921	Húsavíkurfjara, Borgarfirði eystra.	IB	5. 1 – 50	156
927	Å i Lofoten.	N_4	7. 7 – 50	340
935	Núpssandur, Vopnafj., N.-Múlas.	IC	3. 1 – 50	154

Experiment No 39. Number of bottles: 20.

Liberation: Pos.: 67° 22′ N — 9° 00′ W. 2/8 1949.

954	Dvergasteinn, Seyðisfjörður.	IB	11. 1 – 50	162
956	Vogur, Raufarhöfn.	IE	10. 1 – 50	161
958	Hraunhafnartangi, Melrakkaslétta.	IE	10. 1 – 50	161

Experiment No 40. Number of bottles: 20.

Liberation: Pos.: 66° 22′ N — 9° 00′ W. 2/8 1949.

962	Gryllefjord, Senja.	N_4	14. 4 – 50	256
963	Sílalækjarreki, Skjálfandi.	IE	26. 4 – 50	267

Experiment No 41. Number of bottles: 20.

Liberation: Pos.: 66° 22′ N — 11° 30′ W. 3/8 1949.

986	Giska i Senja, Tromsfylke.	N_4	31. 4 – 50	244
993	Flakstad, Lofoten.	N_4	17. 5 – 50	261
996	Varnes, Hollvik, Laksefj., Finmark.	N_5	4. 6 – 50	279

Experiment No 42. Number of bottles: 10.

Liberation: Pos.: 66° 23′ N — 12° 55′ W. 5/8 1949.

632	Sommaröy.	N_4	17. 5 – 50	285
637	Saltströmmen i Saltenfjorden.	N_5	8. 5 – 50	307
638	Hovden i Vesterålen.	N_4	9. 6 – 50	308

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RIT FISKIDEILDAR.

1940. No. 1. *Árni Friðriksson:* Rannsóknir Fiskideildar 1937—1939. (Investigations carried out by the Fisheries Department of the University Research Institute Reykjavík in the Years 1937—1939. With 11 Illustrations and Summary in English).

No. 2. *Árni Friðriksson:* Lax-rannsóknir 1937—1939. Salmon Investigations in the Years 1937—1939. With 12 Illustrations and Summary in English).

1941. No. 1. *Finnur Guðmundsson and Geir Gígja:* Vatnakerfi Ólfusár—Hvítár. (The River-system Ölfusá—Hvítá. With 5 Illustrations and a Map. Summary in German).

1942. No. 1. *Finnur Guðmundsson and Geir Gígja:* Vatnakerfi Blöndu. (The River-system Blanda. With 12 Illustrations. Summary in German).

1944. No. 1. *Árni Friðriksson:* Norðurlands-síldin. (The Herring of the North-Coast of Iceland. With more than 50 Illustrations and 70 Tables. Summary in English).

1950. No. 1. *Árni Friðriksson and Günther Timmermann:* Rannsóknir á hrygningarstöðvum vorgotssíldar vorið 1950. (Herring Spawning Grounds of the South Coast of Iceland during Spring 1950. With 5 Illustrations. No Summary. Extract printed in: J. Conseil Explor. Mer. XVII. No. 2. Copenh. 1951).

1950. No. 2. *Árni Friðriksson and Olav Aasen:* Norsk-íslenzku síldarmerkingarnar. (With 9 Fig. but no Summary. This is a Translation of Á. F. and O. Aa.: The Norwegian-Icelandic Herring Tagging Experiments. Rep. on Norw. Fish, and Mar. Inv. Vol. IX. No. 11. Bergen, Norway 1950).

1952. Nr. 1. *Árni Friðriksson and Olav Aasen:* The Norwegian-Icelandic Herring Tagging Experiments. Report No. 2. (With 13 Illustrations).

Previous to the *Rit Fiskideildar* the following papers were issued about fisheries investigations:

1932. *Árni Friðriksson:* Fiskirannsóknir I. 1931 (Fish. Inv. 1931). This paper (without summary) did not appear independently being printed in the annual report of The Fishery Association of Iceland (Fiskifélag Íslands).

1933. *Árni Friðriksson:* Fiskirannsóknir II. 1932 (14 figures).

1934. — — : — III. 1933 (11 —).

1935. — — : — IV. 1934 (11 —).

1936. — — : — V. 1935 (11 —).

1937. — — : — VI. 1936 (11 —).

A very limited supply of *Rit Fiskideildar* (except 1944, 1) and of *Fiskirannsóknir* (except No. 1) is available in exchange.